

CLAIMS

1. A circuit array module for interconnection with similar circuit array modules, the circuit array module comprising:
 - a module body comprising an electrical circuit, a top surface, a bottom surface, and four lateral surfaces;
 - at least one top connector located on the top surface;
 - at least one bottom connector located on the bottom surface; and
 - at least three side connectors, wherein at least one of the at least three side connectors is each located on a different surface of the four lateral surfaces, wherein each of the at least one top connector, the at least one bottom connector and the at least four side connectors are suitable for connecting to an adjacent connector that is mounted on an opposite surface of a similar module body.
2. The circuit array module according to claim 1, wherein at least one of the at least one top connector, the at least one bottom connector and the at least four side connectors comprise electrical signal conductors.
3. The circuit array module according to claim 1, wherein at least one of the at least one top connector, the at least one bottom connector and the at least three side connectors couple signals that terminate within the module body.
4. The circuit array module according to claim 1, wherein at least one of the at least one top connector,
 - the at least one bottom connector, and
 - the at least three side connectorscouple signals that are coupled to at least one connector located on a different surface of the module body.

5. A circuit array module, comprising:
 - a module body comprising a processor;
 - a configuration storage for storing a plurality of configuration definitions, wherein at least two of the plurality of configuration definitions define different configurations for the processor and wherein each configuration definition within the plurality of configuration definitions is associated with a specified identity;
 - an attribute detector for determining an attribute of the module body; and
 - a configuration selector for selecting a selected configuration definition from the plurality of configuration definitions depending on the attribute.
6. The circuit array module according to claim 5, wherein the attribute detector determines a serial number that is associated with the module body.
7. The circuit array module according to claim 5, wherein the attribute detector determines a module type of the module body.
8. The circuit array module according to claim 5, wherein the attribute detector determines at least one component that is available within the module body.
9. The circuit array module according to claim 5, wherein the processor comprises at least one of a programmable computer, a microprocessor, a micro-controller, a reduced instruction set computer and a digital signal processor.
10. The circuit array module according to claim 5, wherein the processor comprises at least one of a field programmable gate array, an analog to digital converter and a digital to analog converter.

11. The circuit array module according to claim 5, wherein the module body comprises at least one of a cross-point switch, a memory device, a programmable termination network, user circuit connections, test equipment connections and a wiring interconnect.
12. The circuit array module according to claim 5, wherein the configuration selector receives an attribute query command and transmits, in response to the command, at least one of a module identification, a module location, a description of module memory sizes and types, a module performance parameter and a module serial number.
13. The circuit array module according to claim 5, further comprising a connector for connecting the processor to an adjoining circuit array module.
14. The circuit array module according to claim 13, wherein the adjoining circuit array module is able to be connected to at least one additional circuit array module.
15. The circuit array module according to claim 14, wherein the identity depends on at least one of the adjoining circuit array module and the at least one additional circuit array module.
16. The circuit array module according to claim 13, wherein the connector conveys at least one of test stimulus data, response data and continuous data output.
17. The circuit array module according to claim 13, wherein the configuration selector further accepts a configuration command through the connector and wherein the selected configuration definition is selected based at least in part upon the configuration command.

18. The circuit array module according to claim 13, wherein the configuration storage receives additional configuration definitions for storage from the connector.

19. The circuit array module according to claim 13, further comprising:
a circuit location detector for receiving circuit location input information from the adjoining circuit array module and producing a circuit location indicator in dependence upon the circuit location input information, and wherein the attribute depends upon the circuit location indicator.

20. The circuit array module according to claim 19, further comprising at least one additional connector for at least outputting the circuit location output information.

21. The circuit array module according to claim 13, further comprising at least a second connector for connecting to at least a second adjoining circuit array module.

22. The circuit array module according to claim 15, wherein at least one signal communicated through the connector is further communicated through at least one of the at least one second connector.

23. The circuit array module according to claim 16, wherein the connector is located on a first surface of the module and at least one of the at least one second connector is located on a second surface of the module, wherein the second surface is opposite the first surface.

24. The circuit array module according to claim 21, wherein the configuration selector transmits the attribute through the connector.

25. The circuit array module according to claim 21, wherein an attribute descriptor is received through the connector and relayed through the second connector.
26. The circuit array module according to claim 21, wherein at least one signal received through the connector is processed by the processor to produce an output signal, and the output signal is transmitted through the second connector.
27. The circuit array module according to claim 21, wherein at least one signal is routed from the connector to the second connector, wherein the routing is based at least in part on the selected configuration definition.
28. A method for defining a plurality of circuit configurations for a reconfigurable module, the method comprising:
defining a first circuit configuration of a circuit for a first reconfigurable module, wherein the first reconfigurable module is able to connect to a second reconfigurable module at more than one of a plurality of locations and wherein the first circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a first location within the plurality of locations; and
defining a second circuit configuration of the circuit for the first reconfigurable module, wherein the second circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a second location within the plurality of locations.
29. The method according to claim 28, further comprising:
determining, via a query to the first reconfigurable module, a current connection location for the second reconfigurable module to the first module; and
setting the first location to the current location.

30. The method according to claim 28, further comprising:
downloading the first circuit configuration and the second circuit configuration to the first reconfigurable module; and
downloading a specification of the first location and of the second location to the first reconfigurable module.

31. A computer program product comprising computer-programming instructions for a reconfigurable module, the computer programming instructions comprising instructions for:
defining a first circuit configuration of a circuit for a first reconfigurable module, wherein the first reconfigurable module is able to connect to a second reconfigurable module at more than one of a plurality of locations and wherein the first circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a first location within the plurality of locations; and
defining a second circuit configuration of the circuit for the first reconfigurable module, wherein the second circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a second location within the plurality of locations.

32. The computer program product according to claim 31, further comprising instructions for:
determining, via a query to the first reconfigurable module, a current connection location for the second reconfigurable module to the first module; and
setting the first location to the current location.

33. The computer program product according to claim 31, further comprising instructions for:

downloading the first circuit configuration and the second circuit configuration to the first reconfigurable module; and

downloading a specification of the first location and of the second location to the first reconfigurable module.

34. A module circuit configuration system comprising:

a first circuit design tool for defining a first circuit configuration of a circuit for a first reconfigurable module, wherein the first reconfigurable module is able to connect to a second reconfigurable module at more than one of a plurality of locations and wherein the first circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a first location within the plurality of locations; and

a second circuit design tool for defining a second circuit configuration of the circuit for the first reconfigurable module, wherein the second circuit configuration depends upon the second reconfigurable module being connected to the first reconfigurable module at a second location within the plurality of locations.

35. The module circuit configuration system according to claim 34, further comprising:

a module query tool for determining, via a query to the first reconfigurable module, a current connection location for the second reconfigurable module to the first module, and

wherein the first circuit design tool further sets the first location to the current location.

36. The module circuit configuration system according to claim 34, further comprising a circuit configuration downloader for:

- downloading the first circuit configuration and the second circuit configuration to the first reconfigurable module; and

- downloading a specification of the first location and of the second location to the first reconfigurable module.

37. A location determination circuit for determining a location of a module within a series of at least two modules, the location determination circuit comprising:

- at least two input lines, wherein the at least two input lines have a sequential order;

- at least two resistors, wherein each of the at least two resistors connects one of the at least two input lines to a first logic level; and

- at least two output lines, wherein the at least two output lines have the sequential order,

- wherein a lowest order output line of the at least two output lines is connected to a second logic level and wherein the remaining output lines of the at least two output lines are each connected to a one lower order input line of the at least two input lines.